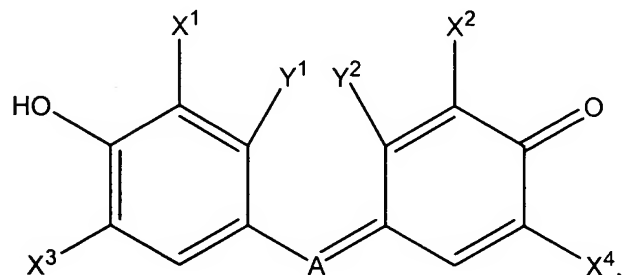


## WHAT IS CLAIMED IS:

1. A compound having the structure:



wherein:

$X^1$  and  $X^2$  are each independently H, Me, F, Cl, Br, I,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{CONMe}_2$ , CN, or  $\text{NO}_2$ ;

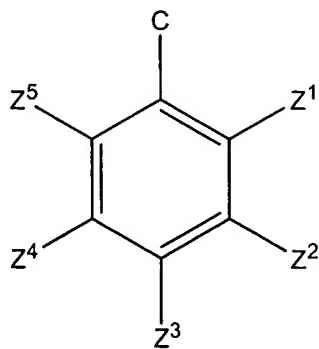
$X^3$  is  $\text{NHCH}_2\text{R}$ , or  $\text{NHSO}_2\text{R}$ , wherein R is  $\text{CH}_2\text{COOH}$ ,  $\text{CH}_2\text{CH}_2\text{NG}^1\text{G}^2$ , substituted 2-hydroxyphenyl, or a five or six-membered heterocyclic ring,  $G^1$  and  $G^2$  are H, Me, Et,  $\text{CH}_2\text{CH}_2\text{OH}$ , or together are  $-(\text{CH}_2)_4-$ ,  $-(\text{CH}_2)_5-$ ,  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$ , or  $-\text{CH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2-$ ;

$X^4$  is H, Me, F, Cl, Br, I,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{H}$ , CN, OMe,  $\text{NHCH}_2\text{R}$ , or  $\text{NHSO}_2\text{R}$ , wherein R is as defined above,

$Y^1$  and  $Y^2$  are each independently H, or taken together are -O-, -S-, -Se-,  $-\text{CMe}_2-$ , -NH-, -NMe-, or -NPh-;

A is N, CH, C-CN, C- $\text{CF}_3$ , C- $\text{CH}_2\text{CH}_2\text{COOH}$ , C- $\text{CH}=\text{CHCOOH}$ ,

or



wherein:

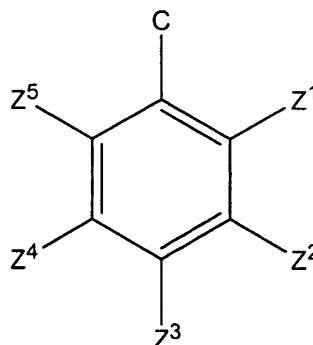
$Z^1$  is H,  $\text{CO}_2\text{H}$ , or  $\text{SO}_3\text{H}$ ;

$Z^2$  and  $Z^5$  are each independently H, F, or Cl;

$Z^3$  and  $Z^4$  are independently H, F, Cl,  $\text{CO}_2\text{H}$ ,  $\text{NO}_2$ ,  $\text{NH}_2$ , NCS,  $\text{NHCOCH}_2\text{I}$ ,  $\text{SCH}_2\text{COOH}$ ,  $\text{SCH}_2\text{CH}_2\text{NH}_2$ , (N-succinimidyl)oxycarbonyl, (N-succinimidyl)oxycarbonylmethylthio, N-maleimidyl, 3,5-dichloro-2,4,6-triazinylamino,  $\text{CONHQ}$ , or  $\text{SO}_2\text{NHQ}$ , wherein Q is H,  $\text{C}_1\text{-C}_{20}$  alkyl,  $(\text{CH}_2)_m\text{COOH}$ ,  $(\text{CH}_2)_n\text{NH}_2$ , or  $(\text{CH}_2\text{CH}_2\text{O})_k\text{CH}_2\text{CH}_2\text{NH}_2$ , wherein m is 1 to about 11, n is 2 to about 12, and k is 1 to about 3

or tautomers and physiologically acceptable salts thereof.

2. The compound of claim 1, wherein A is



wherein:

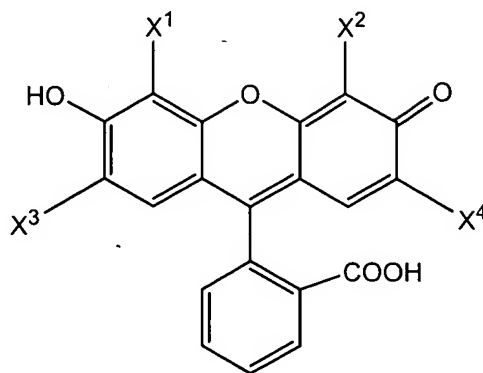
$Z^1$  is H,  $\text{CO}_2\text{H}$ , or  $\text{SO}_3\text{H}$ ;

$Z^2$  and  $Z^5$  are each independently H, F, or Cl;

$Z^3$  and  $Z^4$  are independently H, F, Cl,  $\text{CO}_2\text{H}$ ,  $\text{NO}_2$ ,  $\text{NH}_2$ , NCS,  $\text{NHCOCH}_2\text{I}$ ,  $\text{SCH}_2\text{COOH}$ ,  $\text{SCH}_2\text{CH}_2\text{NH}_2$ , (N-succinimidyl)oxycarbonyl, (N-succinimidyl)oxycarbonylmethylthio, N-maleimidyl, 3,5-dichloro-2,4,6-triazinylamino,  $\text{CONHQ}$ , or  $\text{SO}_2\text{NHQ}$ , wherein Q is H,  $\text{C}_1\text{-C}_{20}$  alkyl,  $(\text{CH}_2)_m\text{COOH}$ ,  $(\text{CH}_2)_n\text{NH}_2$ , or  $(\text{CH}_2\text{CH}_2\text{O})_k\text{CH}_2\text{CH}_2\text{NH}_2$ , wherein m is 1 to about 11, n is 2 to about 12, and k is 1 to about 3

3. The compound of claim 3, wherein  $Z^1$  is  $\text{CO}_2\text{H}$ , and  $Z^2$ ,  $Z^3$ ,  $Z^4$ , and  $Z^5$  are each independently H.

4. A compound having the structure:



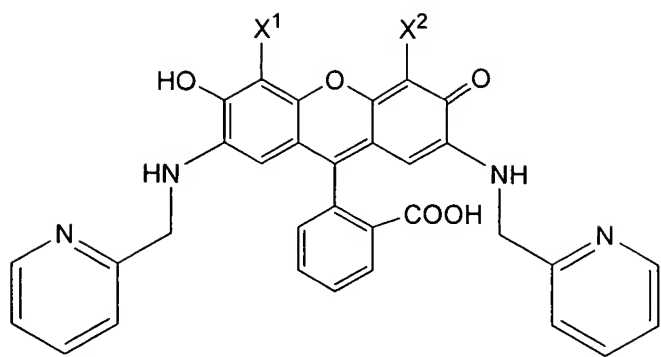
wherein:

$X^1$  and  $X^2$  are each independently H, Me, F, Cl, Br, I,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{CONMe}_2$ , CN, or  $\text{NO}_2$ ; and

$X^3$  and  $X^4$  are  $\text{NHCH}_2\text{R}$  or  $\text{NHSO}_2\text{R}$ , wherein R is  $\text{CH}_2\text{COOH}$ ,  $\text{CH}_2\text{CH}_2\text{NG}^1\text{G}^2$ , substituted 2-hydroxyphenyl, or a five or six-membered heterocyclic ring,  $G^1$  and  $G^2$  are H, Me, Et,  $\text{CH}_2\text{CH}_2\text{OH}$ , or together are  $-(\text{CH}_2)_4-$ ,  $-(\text{CH}_2)_5-$ ,  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$ , or  $-\text{CH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2-$ .

5. The compound of claim 4, wherein  $X^3$  and  $X^4$  are each independently  $\text{NHSO}_2\text{R}$ , wherein R is  $\text{CH}_2\text{COOH}$ ,  $\text{CH}_2\text{CH}_2\text{NG}^1\text{G}^2$ , substituted 2-hydroxyphenyl, or a five or six-membered heterocyclic ring, and wherein  $G^1$  and  $G^2$  are H, Me, Et,  $\text{CH}_2\text{CH}_2\text{OH}$ , or  $G^1$  and  $G^2$  taken together are  $-(\text{CH}_2)_4-$ ,  $-(\text{CH}_2)_5-$ ,  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$ , or  $-\text{CH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2-$ .

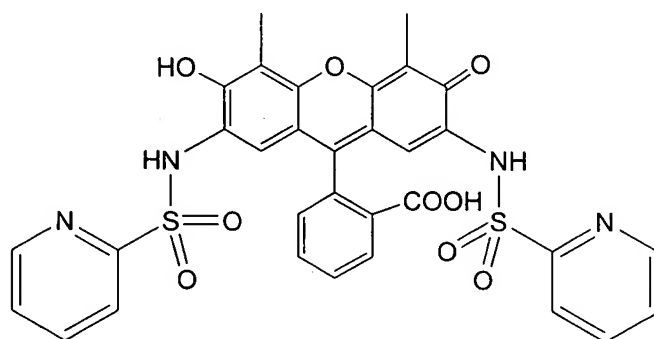
6. The compound of claim 4 having the structure



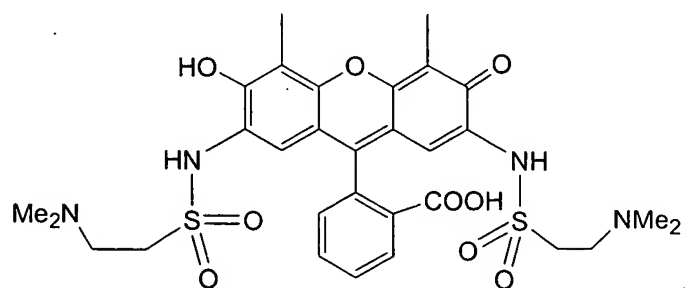
wherein:

$X^1$  and  $X^2$  are each independently Me or Cl.

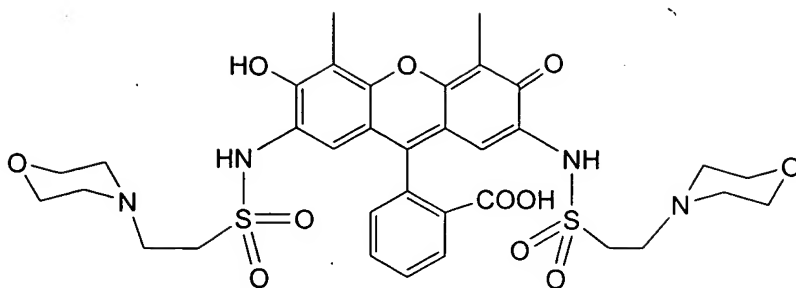
7. The compound of claim 5 having the structure



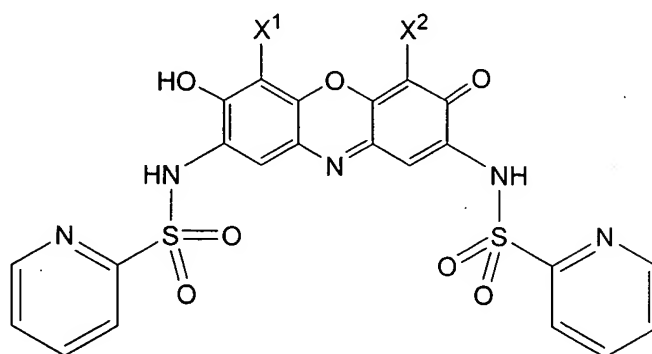
8. The compound of claim 5 having the structure



9. The compound of claim 5 having the structure



10. The compound of claim 1 having the structure

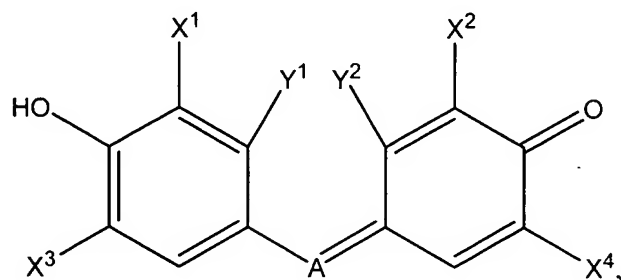


wherein  $X^1$  and  $X^2$  are each independently H or Me.

11. The compound of claim 1, wherein the compound reacts with a target sequence in the presence of  $Zn^{2+}$  ion to generate a detectable signal.
12. The compound of claim 1, wherein the compound reacts with a target sequence in the presence of  $Zn^{2+}$  ion to generate a fluorescent signal.
13. The compound of claim 12, wherein the target sequence is a histidine-rich peptide sequence.
14. The compound of claim 13, wherein the histidine-rich peptide sequence comprises about 6 histidine residues.
15. The compound of claim 1, wherein the compound is capable of traversing a biological membrane.

16. A kit comprising a compound of claim 1, wherein in the presence of  $\text{Zn}^{2+}$  ion, the compound is capable of binding to a target sequence in a recombinant fusion protein; and a binding partner comprising a target sequence, the target sequence comprising a histidine-rich peptide sequence.
17. The kit of claim 16, wherein the target sequence comprises about 6 histidine residues.
18. The kit of claim 16, wherein the compound reacts with the target sequence in the presence of  $\text{Zn}^{2+}$  ion to generate a detectable signal.
19. The kit of claim 18, wherein the detectable signal is a fluorescent signal.
20. A complex comprising
  - a. a compound of claim 1;
  - b. a targeting sequence comprising a histidine-rich peptide sequence; and
  - c.  $\text{Zn}^{2+}$  ion.
21. The complex of claim 20, wherein the histidine-rich peptide sequence comprises about 6 histidine residues.

22. A method of labeling a histidine-rich protein, comprising providing a fusion protein comprising a native protein and a targeting sequence, and contacting the fusion protein in the presence of an effective amount of  $\text{Zn}^{2+}$  ion with a compound having the structure:



wherein:

$X^1$  and  $X^2$  are each independently H, Me, F, Cl, Br, I,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{H}$ ,  $\text{CONH}_2$ ,  $\text{CONMe}_2$ , CN, or  $\text{NO}_2$ ;

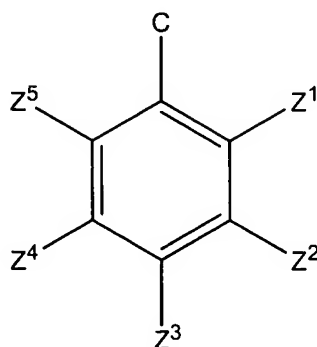
$X^3$  is  $\text{NHCH}_2\text{R}$ , or  $\text{NHSO}_2\text{R}$ , wherein R is  $\text{CH}_2\text{COOH}$ ,  $\text{CH}_2\text{CH}_2\text{NG}^1\text{G}^2$ , substituted 2-hydroxyphenyl, or a five or six-membered heterocyclic ring,  $G^1$  and  $G^2$  are H, Me, Et,  $\text{CH}_2\text{CH}_2\text{OH}$ , or together are  $-(\text{CH}_2)_4-$ ,  $-(\text{CH}_2)_5-$ ,  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$ , or  $-\text{CH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2-$ ;

$X^4$  is H, Me, F, Cl, Br, I,  $\text{SO}_3\text{H}$ ,  $\text{CO}_2\text{H}$ , CN, OMe,  $\text{NHCH}_2\text{R}$ , or  $\text{NHSO}_2\text{R}$ , wherein R is as defined above,

$Y^1$  and  $Y^2$  are each independently H, or taken together are  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{Se}-$ ,  $-\text{CMe}_2-$ ,  $-\text{NH}-$ ,  $-\text{NMe}-$ , or  $-\text{NPh}-$ ;

A is N, CH, C-CN, C- $\text{CF}_3$ , C- $\text{CH}_2\text{CH}_2\text{COOH}$ , C- $\text{CH}=\text{CHCOOH}$ ,

or



wherein:

$Z^1$  is H,  $\text{CO}_2\text{H}$ , or  $\text{SO}_3\text{H}$ ;

$Z^2$  and  $Z^5$  are each independently H, F, or Cl;

$Z^3$  and  $Z^4$  are independently H, F, Cl,  $\text{CO}_2\text{H}$ ,  $\text{NO}_2$ ,  $\text{NH}_2$ , NCS,  $\text{NHCOCH}_2\text{I}$ ,  $\text{SCH}_2\text{COOH}$ ,  $\text{SCH}_2\text{CH}_2\text{NH}_2$ , (N-succinimidyl)oxycarbonyl, (N-succinimidyl)oxycarbonylmethylthio, N-maleimidyl, 3,5-dichloro-2,4,6-triazinylamino,  $\text{CONHQ}$ , or  $\text{SO}_2\text{NHQ}$ , wherein Q is H,  $\text{C}_1\text{-C}_{20}$  alkyl,  $(\text{CH}_2)_m\text{COOH}$ ,  $(\text{CH}_2)_n\text{NH}_2$ , or  $(\text{CH}_2\text{CH}_2\text{O})_k\text{CH}_2\text{CH}_2\text{NH}_2$ , wherein m is 1 to about 11, n is 2 to about 12, and k is 1 to about 3,

or tautomers and physiologically acceptable salts thereof,

thereby labeling a histidine-rich protein.

23. The method of claim 22, wherein the targeting sequence is a histidine-rich peptide sequence.

24. The method of claim 23, wherein the histidine-rich peptide sequence comprises about 6 histidine residues.

25. The method of claim 22, wherein the compound generates a detectable signal.

26. The method of claim 25, wherein the signal is a fluorescent signal.

27. The compound of claim 5 having the structure:

